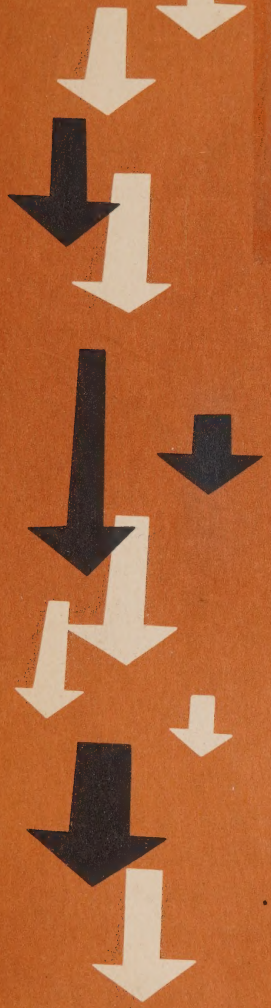
blueprint for survival no. 2



BASEMENT FALLOUT SHELTER

a guide for use in the design of new homes

prepared by
Central Mortgage and Housing Corporation
at the request of
Emergency Measures Organization

FALLOUT SHELTER

for use in the design of new homes

FALLOUT SHELTERS will protect human beings against the dangers of radiation, but it is too late to think of constructing one after the warning has been given.

In the event of nuclear war everyone, even those far from a likely target, will need shelter from fallout. A series of nuclear bombs exploded on this continent could threaten life throughout Canada. When or where fallout will occur is unpredictable. It will depend on the site of the bomb burst, the height of the explosion, the weather at the time, the size and weight of the radioactive particles, the strength and direction of the winds and a variety of other factors.

If the fire ball from a nuclear weapon touches the ground, earth and other pulverized materials are drawn up into the cloud. This dust becomes radioactive and may be deposited over thousands of square miles of territory. Radiation fallout which is undetectable to the human senses could cause varying degrees of sickness or even death. Two factors, in combination, make the disastrous consequences of fallout preventable—time and shielding. Time is a factor because the intensity of radiation from fallout diminishes with its passage. There is only one inexpensive way of shielding human beings from the fallout radiation—a mass of dense material.

Of all the dense materials the cheapest and most readily available is earth. Other relatively inexpensive

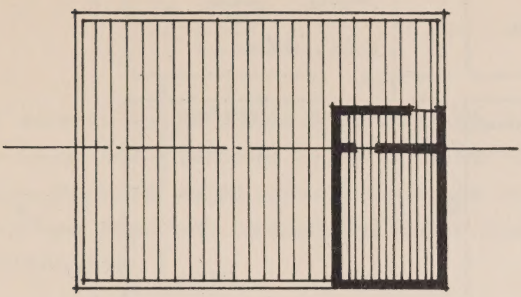
mass materials which give an excellent shield are: poured concrete, solid concrete blocks without cores, and bricks. Hollow blocks may be used if cores are filled with concrete.

To effect the essential amount of mass to produce the desired protection factor in a house the shelter wall construction above ground level should be 16 inches of concrete. Obviously, the higher the grade level the greater the protection afforded in the shelter.

This booklet, Blueprint for Survival No. 2, shows the method of incorporating a basement fallout shelter in the design of a new house compatible with minimum building standards. The Emergency Measures Organization has issued Blueprint for Survival No. 1, describing the construction of basement fallout shelters in existing homes. It may be obtained by writing to Basement Fallout Shelter, Emergency Measures Organization, Privy Council Office, East Block, Ottawa, Ontario. Another pamphlet in the series will deal with back yard shelters to take into consideration other types of house construction.

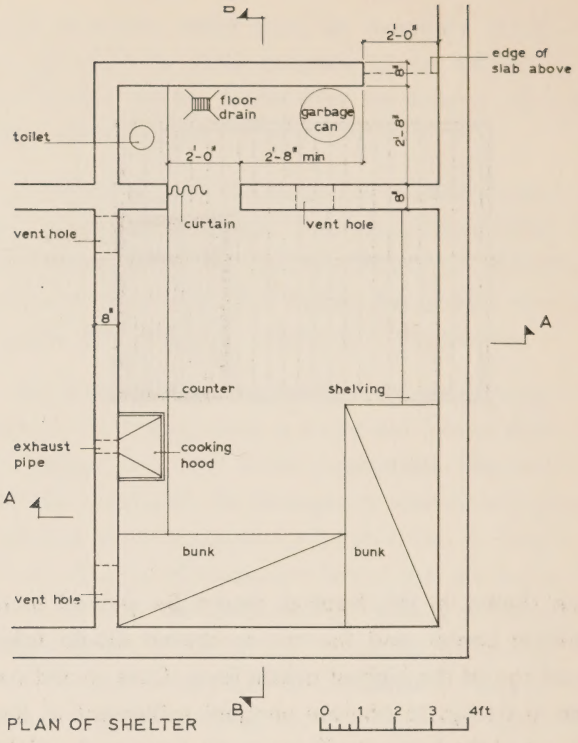
The cost of the shelter in new housing built under the National Housing Act can be considered in the appraised value of the house for mortgage purposes. Basement fallout shelters for existing houses can be financed with a Home Improvement Loan under the National Housing Act.

Up to $500 of additional loan will be made available to assist in the financing of an acceptable fallout shelter in new housing built for home ownership. Where necessary, the maximum loan by regulations may be exceeded by up to $500 for this purpose.



The shelter in this booklet should be placed in a basement corner and the corner chosen should take advantage of the highest grade level. Care should be taken in design to obviate unequal settlement of the shelter and the house itself due to the increased weight of the shelter construction. A restrictive factor in positioning the shelter is that no basement windows can be in the shelter area or near the shelter's entrance, and every other basement window must be shielded. It will be noted that the shielding afforded by the house allows the shelter to have a slab ceiling of only 8″ of concrete.

It was with the knowledge that most of those not in the range of the blast and heat will survive if they have protection from radioactive fallout, that the basic criteria for shelter design in this pamphlet has been provided.



PLAN OF SHELTER

In the drawing, the ruling dimensions are shown; other dimensions will be controlled by the design of the house but in any event the area of the shelter should not be less than 12 square feet or 80 cubic feet per person as an absolute minimum and 15 square feet per person would be desirable in new construction. No shelter should be of less area than 60 square feet.

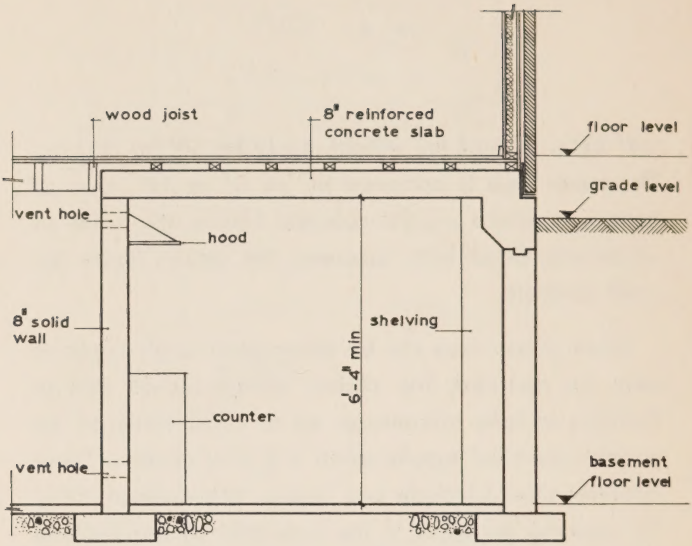
The shielding material which must be provided in the construction of the basement shelter both for internal ceiling slab and walls of 8″ thickness should have a weight of not less than 80 to 100 lbs. per sq. ft. For a

16″ external wall the weight should be 160 to 200 lbs. The lower limit is achieved by an 8″ or 16″ wall of hollow, standard weight concrete blocks, the voids of which are filled with concrete, the upper figure by solid concrete.

Since power may not be interrupted in all areas or may be restored, the shelter design should include facilities to take advantage, up to 1500 watts, of the normal electrical supply when it is in operation. These facilities should include one duplex convenience outlet for cooking purposes in the proximity of the cooking counter and at least one lighting fixture.

As a reserve water supply in addition to the water stored in the shelter, a ½ inch supply pipe should be attached to the drain outlet of the hot water tank and carried into the shelter. To allow the water to flow freely it will be necessary to vent the system by means of an open hot water tap after the main inlet valve to the house has been closed.

To provide ventilation in the shelter, hollow blocks laid on edge will form suitable openings. Although block designs differ, most blocks will provide about the same area of opening, 40 square inches per block. Four blocks should be arranged in pairs, two at the top and two at the bottom of the shelter, providing up to 80 square inches of opening at each level.



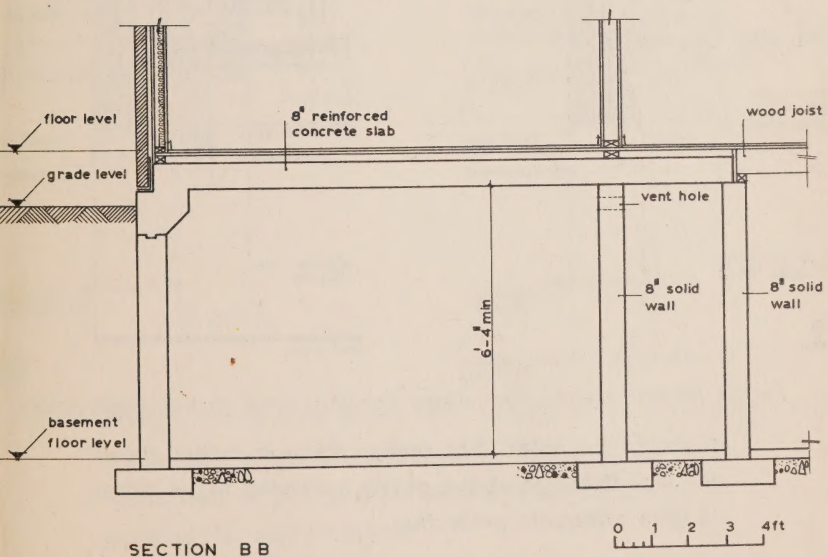
SECTION A A

This sketch shows a longitudinal section of the shelter with an absolute minimum height of 6'4".

When duct work and pipes are necessary to service room or rooms above the shelter they should be accommodated between the top of the ceiling slab and flooring. It may be necessary in some cases to drop the slab while still maintaining the minimum height of 6'4".

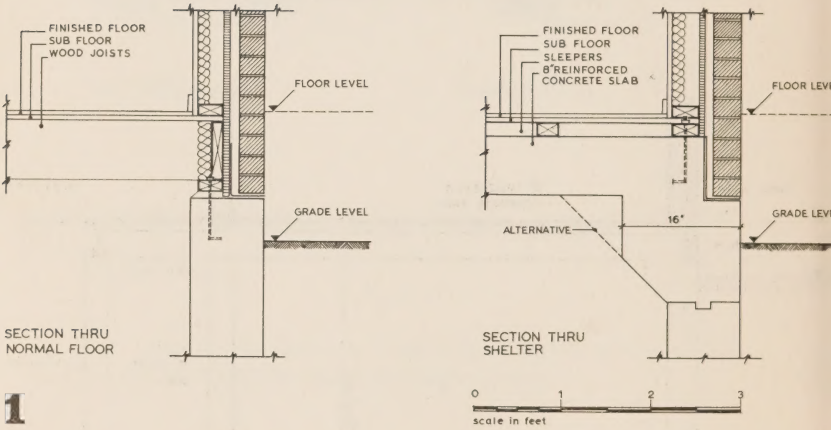
For further details of foundation wall and ceiling slab in relation to grade see details 1, 2 and 3 on pages 8 and 9.

It will be noted there is a metal vent provided directly over the cooking appliances. This will both improve ventilation and remove combustion products.



SECTION B B

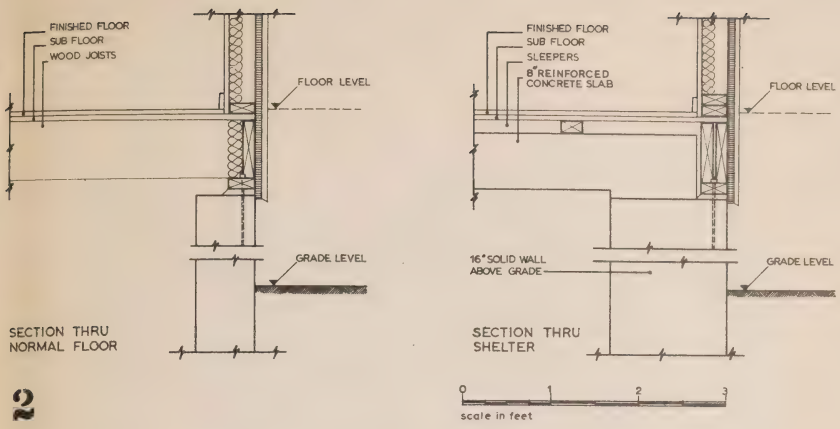
■ These details show only certain conditions. In construction across the country there will be many other combinations of wall, floor and grade level relationships which will require modification. The basic design factor remains—ALL EXTERNAL WALLS BELOW THE SLAB AND ABOVE THE GRADE MUST HAVE A MINIMUM THICKNESS OF 16″ OF CONCRETE AND THE SHELTER SLAB MUST HAVE A MINIMUM THICKNESS OF 8″ OF CONCRETE.



1

Section through normal floor shows standard brick veneer construction.

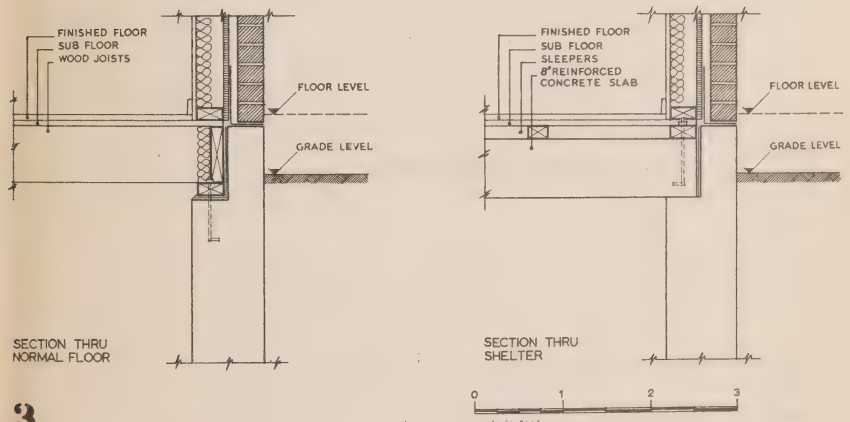
It should be noted that section through shelter shows the wall thickness above grade increased to 16 inches to give adequate protection.



2

Section through normal floor shows typical frame construction with either wood or stucco finish.

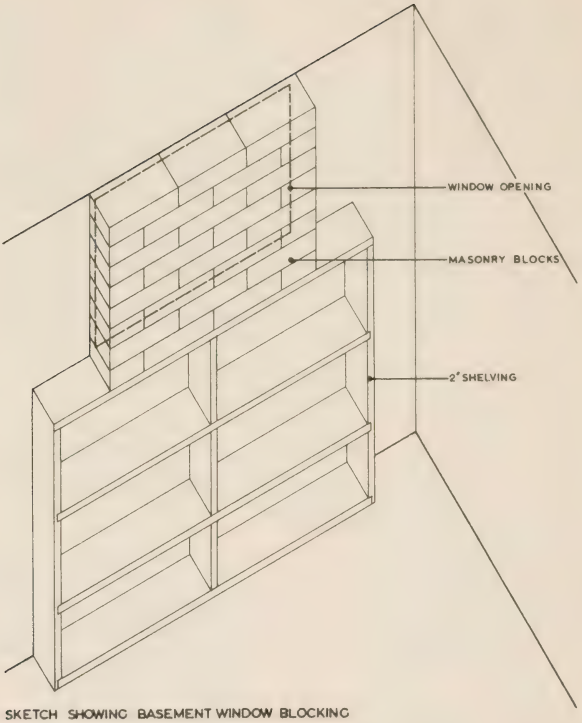
Because of the lower grade the wall is shown increased to 16-inch thickness but only that part above grade level need be a solid wall.



3

Section through normal floor shows brick veneer with a high grade level.

It will be noted because the grade level is higher than the bottom of the concrete slab it is not necessary to increase the wall thickness.



SKETCH SHOWING BASEMENT WINDOW BLOCKING

- *The blocks should give a wall thickness of 8 inches.*
- *To minimize the effort required to raise the blocks from their stored position a maximum block size of 16" x 8" x 4" is recommended.*
- *For easy access the blocks should be stored in the shelving below the window shown on sketch.*

INSIDE THE SHELTER, the health of a family will depend to a large degree upon the standards of sanitation and personal hygiene adopted.

The major concern will be disposal of human waste. It is recommended that a sanitary toilet be installed and provided with polyethylene bags. Each shelter should be equipped with at least a two-weeks supply of large-size bags. After use they should be tied at the neck and deposited in the garbage can or other suitable metal container until they can be disposed of. For the first 48 hours at least, the toilet and garbage can should be placed in the entrance passageway to the shelter. During this period, a family should remain within the shelter, unless otherwise officially advised, so blocking this passageway will not matter. After 48 hours, it may be possible to move both items further out into the basement.

In the plan a floor drain is shown in the passageway. It may be placed within the shelter enclosure itself but a drain is necessary for the disposal of waste fluids. A curtain of heavy material, such as canvas, should be placed across the entrance doorway. The curtain is a means of controlling drafts in cold weather but can be opened at will to provide more ventilation if necessary. Shelving should be provided for storage purposes with a minimum of three cubic feet per person for food storage and a counter placed under the cooking vent

for convenience. In the plans, built-in bunks and shelving have been indicated only as a suggested layout for this shelter. For other floor plans of shelters, modifications will be required.

If an area becomes contaminated with radioactivity it may be necessary to remain in the cellar from two to fourteen days. During this period a family's only contact with the outside world will be by radio. Therefore a battery powered radio will be a necessary part of shelter equipment. It is important that radio reception in the shelter be checked because it is possible an aerial will be required.

Additional information on shelter supplies, shelter discipline, etc. may be obtained from Blueprint for Survival No. 1 published by the Emergency Measures Organization.

The drawings in the pamphlet give only basic criteria; reinforced concrete work must be designed by a registered architect or engineer.

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